APPENDIX A.

OPINION OF THE COURT OF APPEALS.

IN THE UNITED STATES COURT OF APPEALS,

For the Seventh Circuit.

No. 14830 SEPTEMBER TERM 1966—JANUARY SESSION, 1967

ESTHER MARION ARMSTRONG, EXECUTRIX, *Plaintiff-Appellee,*

vs.

MOTOROLA, INC., *Defendant-Appellant.*

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.

February 6, 1967.

Before HASTINGS, *Chief Judge,* and FAIRCHILD and CUMMINGS, *Circuit Judges.*

CUMMINGS, *Circuit Judge.* This patent infringement action concerns three frequency modulation (FM) patents owned by the late Major Edwin Armstrong. The plaintiff is his widow and executrix.

The three patents involved are No. 1,941,069 ('069) covering the wideband FM system, No. 1,941,066 ('066) covering the synchronous heterodyne method for FM reception, and reissue patent No. 21,660 ('660) covering a preemphasis and deemphasis system for use in FM. The

'069 and '066 patents issued on December 26, 1933, and reissue patent '066 issued on December 17, 1940.

In an exhaustive opinion, District Judge Robson held that the three patents were valid and infringed by Motorola, Inc.'s FM receivers. He also held that Motorola's FM communication equipment infringed the '069 and '066 patents. For a complete description of the history of this litigation, reference is made to the District Court's extensive findings reported in 230 F. Supp. 337 (N. D. Ill. 1964). The same patents were involved in *Armstrong* v. *Emerson Radio and Phonograph Corp.*, 179 F. Supp. 95 (S. D. N. Y. 1959), where, in a very thorough opinion, Judge Palmieri also held them valid and infringed.

In the present case, with the consent of the parties, the District Judge appointed George R. Town, Dean of the College of Engineering at Iowa State University, to act as his impartial technical expert. Dean Town filed a report on the technical issues in the case and excerpts from his report were later received in evidence.

To avoid an unnecessarily voluminous opinion, the facts of the present case will be discussed in conjunction with the contested issues. Because of their ready accessibility, the 339 findings below (230 F. Supp. at pp. 338-379) will only be highlighted here.

Estoppel

Motorola first claims that by December 1948, when notices of infringement were sent to Motorola and others, Armstrong was estopped from suing Motorola on these three patents. Based on 36 findings of fact, most of them carefully annotated by references to the trial record and the exhibits, the District Court rejected this defense. Unless clearly erroneous, those findings are binding on appeal. *Armour & Co.* v. *Wilson & Co.*, 274 F. 2d 143, 149, 156 (7th

Cir. 1960). In our view, the findings bearing on the estoppel defense are not clearly erroneous. Based on those findings, the District Court properly rejected the estoppel defense. The related defense of laches, rejected below, was not renewed in this Court.

In 1940, Motorola decided to manufacture and sell FM apparatus for police and mobile communication. In the same year, Motorola decided to add FM broadcast receivers to its line of home receivers. At the time Motorola entered the FM market, Major Armstrong was acknowledged as the inventor of the wideband FM system. Motorola's predecessors as FM apparatus manufacturers had taken licenses under Major Armstrong's FM patents.[1]

Upon Motorola's inquiry in April 1940, Major Armstrong sent appropriate patent license forms to Motorola. He advised Motorola that his '069 patent covered the FM system, that his '066 patent was important in the receiver field, and that he owned other patents useful in the FM system. Motorola knew that Major Armstrong expected to receive royalties on a uniform basis from all manufacturers of wideband FM apparatus and that he was actively engaged in establishing a uniform licensing system.

Early in 1941, Motorola commenced license negotiations with Armstrong. In May 1941, a Motorola representative stated to Radio Corporation of America (RCA), which had not taken a license under the Armstrong patents, that Motorola might take a license thereunder if Armstrong would reduce his royalty rate from 2½% and 3% to 1%.

The license negotiations between Armstrong and Motorola terminated in August 1941, when Major Armstrong advised Motorola's counsel that he was designat-

1. Major Armstrong's early FM licensees included General Electric Company, Zenith Radio Corporation, Scott Radio Laboratories, Inc., Stromberg-Carlson Company, Stewart-Warner Corporaton, Radio Engineering Laboratories, and F. M. Link.

ing his lawyer, Alfred McCormack, to conduct further negotiations with Motorola for a license under Armstrong's patents. Instead of pursuing those negotiations, Motorola, on advice of its patent counsel, decided late in 1941 that it was not infringing Armstrong's patents and therefore would not take a license from him. In a May 1945 letter to American Telephone & Telegraph Co., Motorola reiterated that it was not infringing the Armstrong FM patents.

In March and April 1941, Armstrong advised the Secretaries of War and of the Navy respectively that "so long as the present national and international emergency shall exist", he would waive all royalties under his FM patents with respect to FM apparatus manufactured for the United States for military purposes. This waiver was a matter of public knowledge. Throughout World War II, Major Armstrong was primarily engaged in research work for the Armed Forces, as was well known.

During World War II, Motorola and other radio manufacturers ceased the production of home receivers and other equipment for broadcast purposes. However, from 1941 through 1945, Motorola did sell FM equipment for police communication under War Production Board releases. It sold no television receivers until 1947.

In January 1946, Western Electric Company took an Armstrong license for FM mobile communication apparatus. Until 1950, Western Electric paid royalties to Armstrong with respect to such apparatus, including substantial quantities that Western Electric purchased from Motorola. In June 1946, Motorola's patent counsel protested Western Electric's payment of Armstrong royalties on Motorola's apparatus, stating that "over the past six years * * * it has been and still is our considered opinion that Motorola's FM equipment does not infringe any valid Armstrong patent. On this basis, Galvin [Manufacturing Company, predeces-

sor to Motorola] has not taken a license from Major Armstrong."

World War II ended on September 2, 1945, but the official cessation of hostilities did not occur until December 31, 1946 (50 App. USCA, p. XXII). By the end of 1947, the post-war market for FM receivers and television receivers reached significant proportions. At that time, Motorola entered the market and sold substantial quantities of such receivers in competition with Armstrong licensees.[2] Motorola's other competitors included RCA, Philco Corporation, Emerson Radio and Phonograph Corporation, and Admiral Corporation. These four manufacturers had not been licensed by Major Armstrong either. In July 1948, a few months after the resurgence in sales of FM apparatus, Major Armstrong filed suit against RCA for infringement of the '066, '069 and reissue '660 patents. Six months thereafter, Major Armstrong sent a written notice of infringement to Motorola and other alleged infringers of his FM patents.

In January 1949, RCA informed its licensees, including Motorola, that RCA would complete the Armstrong-RCA litigation before any other contemplated patent infringement suits could be started and completed by Armstrong.

From 1953 to 1957, because of unfavorable market conditions, Motorola discontinued the manufacture and sale of FM broadcast receivers. The present complaint against Motorola was filed in January 1954. The Armstrong suit against RCA was settled for $1,040,000 in December 1954. Armstrong's complaint against Emerson was filed in December 1953, and a judgment against Emerson was entered in September 1959. See 179 F. Supp. 95.

The District Court found that Motorola's refusal to take

2. These Armstrong licensees included Westinghouse Electric Corporation, Hallicrafters Company, and the major companies listed in note 1, *supra*.

a license from Major Armstrong was based on its opinion that it was not infringing his patents and was not in reliance upon any acquiescence by Major Armstrong. Instead, he openly maintained that all manufacturers of wideband FM apparatus should be licensed by him. Therefore, there was no basis for Motorola's claim of estoppel. Our study of the record shows that the District Court's findings may not be disturbed because they not only satisfy the "clearly erroneous" rule but are supported by substantial evidence.

While actively engaged in war work, Major Armstrong was justified in not suing any infringers. During the period of World War II, "all reasonable postponement and suspension of litigation was a public duty" (*Alliance Securities Co.* v. *De Vilbiss Mfg. Co.*, 41 F. 2d 668, 669-670 (6th Cir. 1930); *Harries* v. *Air King Products Co.*, 87 F. Supp. 572, 588-589 (E. D. N. Y. 1949), affirmed, 183 F. 2d 158, 159 (2nd Cir. 1950)). Moreover, Armstrong's 1948 suit against RCA justified Armstrong's refraining from suing Motorola simulaneously. As stated in *Montgomery Ward & Co.* v. *Clair*, 123 F. 2d 878, 883 (8th Cir. 1941):

> "An inventor is not required to litigate the validity of his patent against every possible infringer. A suit pending to sustain the validity of a patent is notice to all infringers of the insistence of the patentee upon his claimed rights."

Judge Learned Hand enunciated this same proposition in *Clair* v. *Kastar, Inc.*, 148 F. 2d 644, 646 (2nd Cir. 1945), certiorari denied, 326 U. S. 762, where he also pointed out that the "infringer" should have brought an action for a declaratory judgment. Here too Major Armstrong's and his lawyer's 1941 correspondence with Motorola was sufficiently threatening to give Motorola standing to seek a judgment of non-infringement. *Cf. Sticker Industrial Supply Corp.* v. *Blaw-Knox Co.*, 367 F. 2d 744 (7th Cir. 1966).

In *Lebold* v. *Inland Steel Co.*, 125 F. 2d 369, 375 (7th Cir. 1941), certiorari denied, 316 U. S. 675, Judge Lindley thoroughly explored the estoppel doctrine. As noted there, "Estoppel arises only when one has so acted as to mislead another and the one thus misled has relied on the action of the inducing party to his prejudice." Here Major Armstrong never abandoned his position that Motorola and other companies not licensed under his FM patents were infringers. Also, Motorola did not rely upon any inaction of Major Armstrong but instead decided in late 1941 that it was not infringing his patents and therefore would not take a license. Accordingly, the defense of estoppel must fail. None of the estoppel cases upon which Motorola relies departs from the principles enunciated in the *Lebold* case. Since they are all distinguishable on their facts, they are of no avail to Motorola.

Validity of the Three Patents

Motorola contends that the three patents in question are invalid. Its first claim is that the '069 patent is invalid as indefinite. A similar argument was rejected in *Armstrong* v. *Emerson Radio and Phonograph Corp.*, 179 F. Supp. 95, 128 (S. D. N. Y. 1959) and was also rejected in the District Court here. Motorola asserts that the claims of '069 are indefinite because "lacking a numerical value for the bandwidth." The claims provide that the frequency swing of the transmitter shall be "substantially greater in extent than the frequency range of good audibility", and that the receiver shall be fully responsive to such swings but substantially nonresponsive to lesser frequency variations caused by disturbances. In other words, the claims of the '069 patent called for operation in a bandwidth several times greater than the conventional and optimum bandwidth known in the prior art.

Until Major Armstrong's discovery, the court's expert, Dean Town, stated that to reduce noise, the bandwidth of circuits was decreased. Major Armstrong first discovered that noise reduction could be effected by a wide-band circuit system, and this was the teaching of the '069 patent. Since the two claims of the '069 patent distinctly point out and distinctly claim the art of eliminating or suppressing noise in radio by the wide-band system, it was unnecessary to specify any particular variation in frequency. See 35 USC § 112.

Armstrong is entitled to patent protection on all bandwidths at which his discovery will work well. To restrict him to only one precise width would be to destroy the value of his patent, since anyone who wanted to evade it could do so simply by manufacturing receivers that operate at any other bandwidth.

Motorola contends that the '069 patent was anticipated by Armstrong's prior art patent No. 1,941,447, under which Motorola was purportedly licensed by RCA and others. However, the uncontroverted testimony shows that the '447 patent taught that to reduce noise, the bandwidth is made as narrow as possible. A receiver built under the '447 patent could not operate over a bandwidth several times the amplitude modulation (AM) bandwidth. Since the '447 patent did not disclose the wideband FM system, it did not anticipate the '069 patent and is of no support to Motorola.

Motorola next assails the validity of the '066 patent covering the synchronous heterodyne method for frequency modulation reception. This patent involved heterodyning or combining the received FM wave with itself to reproduce the signal. Again, the validity of this patent was upheld in *Armstrong* v. *Emerson Radio and Phonograph Corp.*, 179 F. Supp. 95 (S. D. N. Y. 1959) as well as here. Motorola now asserts that no one ever used the '066 circuit experimentally, but at the trial Motorola did not dispute the fact

that Major Armstrong had actually so used it. Armstrong's amendment to his '066 application disclosed that the '066 circuit had been working in reception across the continent for some time; this too was undisputed by Motorola in the District Court. It is immaterial that patent '066 did not disclose the particular receiver embodying his synchronous heterodyne method that later achieved commercial success, for the validity of a patent is not impaired by the fact that experimentation or the exercise of judgment is necessary to obtain the particular results desired. *Hildreth* v. *Mastoras*, 257 U. S. 27, 34; *Binks Manufacturing Co.* v. *Ransburg Electro-Coating Corp.*, 281 F. 2d 252, 256-257 (7th Cir. 1960), certiorari dismissed, 366 U. S. 211.

Motorola also relies on prior references as disclosing the synchronous heterodyne method for FM reception. We agree with Judge Palmieri in the *Emerson* case and, with Judge Robson here that Horton patent No. 1,856,707 (issued May 3, 1932) did not disclose the synchronous heterodyne method for FM reception and did not anticipate the '066 patent. Also, it should be noted that the Board of Appeals of the Patent Office held that Armstrong was the prior inventor of the '066 synchronous heterodyne method for FM reception and was entitled as against RCA to the instant claims commensurate with the full scope thereof. In that interference proceeding, Crosby had disclosed a circuit that was essentially the same as Armstrong's and had also disclosed another circuit that was essentially the same as the Foster-Seeley circuit employed by Motorola. In deciding the interference in favor of Armstrong, the Board of Appeals held that the two forms of circuit were equivalent. Since Motorola's ratio detector and Bond circuit are essentially the same as the Foster-Seeley circuit, Motorola's use of the Foster-Seeley circuit, the ratio detector and the Bond circuit is within the broad range of equivalents to which the pioneer '066 patent was entitled. *Hildreth* v. *Mastoras*, 257 U. S. 27, 36.

Motorola contends that the '066 patent is invalid for overclaiming, on the ground that the District Court construed the claims to cover an entire receiver. Actually, the court only construed the claims to cover this synchronous heterodyne system for the detector circuit of an FM receiver, so that Motorola's contention must be rejected.

Motorola urges that the reissue patent '660 is invalid on the ground that it claims an invention which was not claimed or defined in the original patent. It should be noted that the Board of Interference Examiners found that Armstrong's proofs were persuasive that he had first used the preemphasis and deemphasis system disclosed in the original patent as early as 1936. In this reissue patent, the receiver claims cover the structure and operation of a wideband FM receiver with deemphasis circuits and a wide admittance band. The only change in the specification of the reissue patent as compared with the original patent No. 2,215,284 was to substitute "improvement in both the fidelity and signal to noise ratio" for "increase in both the fidelity and noise level." As found by the District Court, the only significant difference between claims 1, 2 and 3 of the reissue patent, as compared with claims 4, 5 and 6 which appear in the reissue patent but not in the original patent, is that claims 1, 2 and 3 cover the transmitter and receiver in combination, or a method of transmitting and receiving, whereas claims 4, 5 and 6 cover a receiver, or a method of reception for receiving an FM wave pre-distorted as provided in claims 1, 2 and 3. Therefore, the reissue patent does not claim a completely different invention but satisfies the terms of the then reissue statute (35 USC, former Section 64),[3] providing that a patent for the same invention may be reissued to the patentee in certain circumstances.

3. The reissue of defective patents is now governed by 35 USC § 251, but the parties agree that both this provision and former Section 64 require that the reissue be confined to the invention disclosed in the original patent.

Here the receiver claims specify that the receiver be adapted for reception of a preemphasized wave, but such wave would be produced only by a transmitter operated as disclosed in the original patent.

Motorola also relies on a July 1939 article by Messrs. Fyler and Worcester, but their publication only respected such information as had been derived by their employer, the General Electric Company, from Major Armstrong. In addition, the Fyler and Worcester article was not published more than a year before the original application for patent No. 2,215,284, and it may not be used to invalidate under 35 USC 102(b) the reissue patent resulting from the reissue application of October 21, 1940. *Union Asbestos & Rubber Company* v. *Paltier Corporation*, 298 F. 2d 48, 51 (7th Cir. 1962), certiorari denied, 369 U. S. 865.

Infringement.

The District Court concluded that all three patents in question were infringed by Motorola. Judge Palmieri reached the same conclusion as to Emerson (179 F. Supp. at pp. 128-129). We agree with the conclusion that Motorola did infringe these patents.

The bandwidth of the circuits of the Motorola FM broadcast television sound and communication receivers are adapted to operate in an FM system with a deviation ratio of five or more for the audible signals to be transmitted and reproduced. These are all wideband FM receivers, the bandwidth being about five times that required in conventional radio signaling. Since such increased bandwidth is in accord with the '069 claims, Motorola clearly infringed the '069 patent.

In comprehensive findings, supported by references to the record and exhibits, the District Court pointed out how Motorola television sound receivers TS-4 and TS-5 are

especially adapted for use in the Armstrong wideband FM system and have no practical use except to receive FM waves sent out by television sound transmitters. The effective bandwidth of each of these receivers is at least 50 kilocycles. We concur in those findings and the ensuing conclusion of infringement.

In equally careful findings, the District Court has shown how Motorola's FM broadcast receivers HS87 and HS89 are capable of receiving FM waves sent out by FM broadcast transmitters, and that each of such receivers has an effective bandwidth of at least 150 kilocycles. Since these receivers were also especially adapted for use in the Armstrong wideband FM system and have no other practical use, the District Court correctly concluded that they also violated patent '069.

As to the Motorola 25-50 Mc and 152-162 Mc FM communication equipment, the District Court noted that their effective bandwidth was at least 30 kilocycles. Since they too were found to be an application of Armstrong's wideband FM system, the District Court properly concluded that they infringed patent '069 covering the wideband FM system. As to both the '069 and '066 patents, it is significant that the Western Electric Company paid royalties to Armstrong from 1946 to 1950 with respect to Motorola two-way FM mobile communication equipment purchased from Motorola and sold by Western Electric. Being a two-way system, this equipment clearly infringed the system claims of the two patents.

With respect to all the foregoing apparatus, Motorola employed a radio frequency bandwidth ten times the range of audible frequencies carried by the band. This was the same range used in Major Armstrong's example in his '069 patent and dramatically illustrates Motorola's infringement.

Motorola argues that the claims of patent '069 involve a method of transmitting *and* receiving FM waves, so that Motorola could not have infringed '069 except in its two-way police communication system. In this connection, Motorola argues that listening with its receivers to a licensed Armstrong station puts Motorola's receivers within the licensed combination (*i.e.*, transmitter and receiver). But if the listening is unauthorized, then the use of the Motorola receivers infringes the combination patent. Here Armstrong's transmitter licenses granted no license for reception (except for monitoring by the licensee). Therefore it follows, even in accordance with the understanding of Motorola's briefs, that Motorola's testing of its receivers by unlicensed listening to the FM broadcasts constituted direct infringement. Motorola argues that its receivers could not violate the Armstrong system patents on transmitters *and* receivers. If this argument had merit, Armstrong would not have succeeded in garnering so many prominent and patent-conscious manufacturers as receiver-licensees! Section 271(a) of the Patent Act (35 USC § 271(a)) provides that "whoever without authority * * * uses any patented invention" is an infringer. Here Motorola tested its receivers by tuning them to transmitters employing the Armstrong FM teachings. This constituted a "use" of the system patent because the radio waves generated by the Armstrong transmitters were received and converted into sound by the Motorola receivers. Motorola concedes that an unlicensed owner-user of an FM transmitter and receiver would violate the Armstrong system patents (apart from questions about their validity and applicability). Section 271(a) of the Patent Act does not require ownership of the system before infringement can occur. The test under the Act is whether there has been use of the system. As shown, such use occurred when Motorola tested these receivers.

As seen, Motorola became a direct infringer by testing its receivers commercially by tuning them to FM broadcast signals and listening to them. Cf. *Radio Corporation of America* v. *Andrea,* 90 F. 2d 612, 614 (2nd Cir. 1937). Motorola also became a contributory infringer by selling its receivers to unlicensed listeners of FM broadcasts, for whoever sells a component of a patented system, knowing that it is especially made for use in infringement of the patent and not for other use, is liable as a contributory infringer. *Aro Manufacturing Co., Inc.* v. *Convertible Top Replacement Co., Inc.,* 377 U. S. 476, 482-493; 35 USC § 271(c).

Motorola attempts to assert that it did not have the requisite knowledge that is an element of contributory infringement, but the record belies this. In 1940, Motorola knew that Armstrong expected to receive royalties on a uniform basis from all manufacturers of FM apparatus. Armstrong had even sent Motorola his form of license for home receivers. Armstrong's patents were of such importance that they were the talk of the industry, and Motorola knew that receivers like its own were licensed by Armstrong. Thus 35 USC § 271(c) is satisfied. In addition, Armstrong's two notices of infringement (discussed *infra* under Notice of Infringement) satisfied the contributory infringement knowledge requirement.

As to the '066 synchronous heterodyne method patent, the District Court found that certain Motorola receivers included a balanced detector circuit known as the Foster-Seeley discriminator, that other Motorola receivers employed a balanced detector known as the ratio detector, and that still other Motorola receivers employed a balanced detector circuit known as the Bond circuit. Motorola claims that the '066 patent could not support claims that covered use of circuits such as the Foster-Seeley discriminator, the detector ratio, and the Bond circuit.

However, such an argument was rejected by the Board of Appeals of the Patent Office during the proceeding involving claims 8, 9 and 10 of the '066 patent in an interference with Crosby patent 2,229,640 owned by RCA. The District Court was of course entitled to consider this interference decision and to give it appropriate weight. *Radio Corporation of America* v. *Radio Engineering Laboratories, Inc.*, 293 U. S. 1, 7. Since the synchronous heterodyne method has been embodied by Motorola in all of its FM receivers, the conclusion that patent '066 had been infringed was proper.

With respect to reissue patent '660 covering a preemphasis and deemphasis system for use in FM broadcasting and television sound broadcasting, the District Court found that Motorola's HS87 and HS89 FM broadcast receivers and its TS-4 and TS-5 television sound receivers were designed for use in a system having an amount or degree of preemphasis and deemphasis disclosed in the reissue patent. Therefore, the District Court correctly concluded that Motorola had infringed claims 1, 2, 4 and 6 of reissue patent '660. As to the receiver claims (4 and 6) of reissue patent '660, Motorola has argued only that invalid claims cannot be infringed. Thus Motorola concedes infringement of such claims if, as we have already held, the claims were valid. For the reasons given above with respect to direct and contributory infringement of patent '069, as to reissue patent '660, Motorola was a direct and contributory infringer under the system claims 1 and 2 (transmitter and receiver) and a direct infringer under receiver claims 4 and 6.

Patent Misuse.

Motorola argues that Armstrong's receiver licenses constituted a misuse barring any recovery on receivers. This argument was rejected below and in the *Emerson* case (179 F. Supp. at p. 128). Motorola advances two separate grounds to support its misuse argument. One ground is that Armstrong's licensing of receiver manufacturers under the *system* patents attempted to extend the patent monopoly to an unpatented article, namely, the receiver. We reject this ground because we have already held that Motorola's unlicensed use of receivers does infringe the system claims.

Motorola's other ground to support its defense of misuse is that it was unlawful for Armstrong to restrict the classes of consumers to whom manufacturer-licensees could sell. Motorola has stated no authority for the proposition that unlawful license restrictions protect a non-licensee (such as Motorola) from infringement liability. However, under *General Talking Pictures* v. *Western Electric Co.*, 304 U. S. 175, 305 U. S. 124, the license restrictions were lawful. There it was determined that:

> "the patentee may grant a license 'upon any condition the performance of which is reasonably within the reward which the patentee by the grant of the patent is entitled to secure.' The restriction here imposed is of that character. The practice of granting licenses for a restricted use is an old one, see *Rubber Company* v. *Goodyear*, 9 Wall. 788, 799, 800; *Gamewell Fire-Alarm Telegraph Co.* v. *Brooklyn*, 14 F. 255. So far as appears, its legality has never been questioned." (305 U. S. at p. 127.)

There the Court noted that the parties had even stipulated that it was a common practice to grant such licenses (*idem*).

Motorola's analysis of later cases has not convinced

us that the *General Talking Pictures* case is no longer good law. In any event, it was certainly good law at the time that Armstrong was granting the licenses assailed by Motorola. Armstrong was certainly not guilty of any unclean hands by relying upon the then patent law in formulating its licenses. The licenses in that case were of greater anti-competitive effect than those here. Also the accused infringer, The American Transformer Company, was a licensee and surely in a better position to defend against a charge of infringement than a non-licensee such as Motorola. The principal authority advanced by Motorola is *United States* v. *Univis Lens Co.*, 316 U. S. 241, but that was a Sherman Act case in which the patentee had been using his patent to achieve resale price maintenance and therefore the case is not in point.[4]

Notice of Infringement.

The District Court found that Armstrong's letters of December 15 and 20, 1948, constituted notice of infringement.[5] Judge Palmieri reached the same conclusion with respect to the December 20 letter in the *Emerson* suit (179 F. Supp. at p. 99).

The letter of December 20 notified Motorola that it was infringing '066, '069 and reissue patent '660 "by practicing methods, and by making, using and selling apparatus, embodying inventions claimed in said patents

4. Motorola's reply brief relies on *Chicago Metallic Manufacturing Co.* v. *Edward Katzinger Co.*, 139 F. 2d 291, 293 (7th Cir. 1943), affirmed, 329 U. S. 394, but there, as in *Univis Lens Co.*, the license agreement carried a provision for price-fixing, as did the licenses in *Philad Co.* v. *Lechler Laboratories, Inc.*, 107 F. 2d 747 (2nd Cir. 1939). Also, this Court did not pass upon the validity of the Katzinger patents.

5. The question whether Motorola received constructive notice prior to December 20, 1948, by reason of patent marking on apparatus sold by Armstrong's licensees was reserved for hearing at the accounting and for determination by the District Court thereafter (230 F. Supp. at p. 380). That question is not reached here.

and each of them." This letter enclosed a longer letter or statement dated December 15, 1948, concerning the three patents. The four-page December 15 statement of Major Armstrong explained that the transmitter and receiver covered by patent '069 were complementary, and that no FM receiver manufacturer could determine whether its receiver worked without utilizing a transmitter and receiver, working together, according to the method and teachings of '069. This letter predicted that the courts would protect Armstrong's invention from direct infringement *or contributory infringement* and stated his intention to enforce his three patents "against infringing manufacturers."

The applicable statute (35 USC § 287) merely requires "proof that the infringer was notified of the infringement and continued to infringe thereafter." The present notice of infringement is sufficient under the statute. *Smith* v. *Dental Products Co.*, 140 F. 2d 140, 151-152 (7th Cir. 1944), certiorari denied, 322 U. S. 743. There we held that the notice provision of the statute (then 35 USC § 49) was satisfied if the infringer were given the same information as the statute requires for patent marking. The marking need only contain the word "patent" (or "pat.") and the number of the patent (35 USC § 287), and the December 20 letter of course contained this information. Cf. *Dunlap* v. *Schofield*, 152 U. S. 244, 247-248. Since these two letters show "that the alleged contributory infringer knew [from the letters] that the combination for which his component was especially designed was both patented and infringing" (*Aro Manufacturing Co.* v. *Convertible Top Replacement Co.*, 377 U. S. 476, 488), Motorola also cannot properly assert that it was not given any notice as to contributory infringement.

We have examined the other contentions raised by Motorola and find them without merit. Therefore, the judgment of the District Court is affirmed.

UNITED STATES COURT OF APPEALS

For the Seventh Circuit

Chicago, Illinois 60604

Monday, February 6, 1967.

Before

Hon. John S. Hastings, Chief Judge;
Hon. Thomas E. Fairchild, Circuit Judge;
Hon. Walter J. Cummings, Jr., Circuit Judge.

ESTHER MARION ARMSTRONG,
Executrix,
Plaintiff-Appellee,
No. 14830 *vs.*
MOTOROLA, INC.,
Defendant-Appellant.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.

This cause came on to be heard on the transcript of the record from the United States District Court for the Northern District of Illinois, Eastern Division, and was argued by counsel.

On consideration whereof, it is ordered and adjudged by this court that the judgment of the said District Court in this cause appealed from be, and the same is hereby, Affirmed, with costs, in accordance with the opinion of this Court filed this day.

APPENDIX B.

Esther Marion ARMSTRONG, Executrix,
Plaintiff,

v.

MOTOROLA, INC., Defendant.

No. 54 C 19.

United States District Court
N. D. Illinois, E. D.

May 14, 1964.

* * * * *

CONCLUSIONS OF LAW AND MEMORANDUM OF DISTRICT COURT.

Conclusions of Law.

1. This Court has jurisdiction over the parties and the subject matter. 28 U. S. C. §§ 1331, 1338.

2. The Executrix was properly substituted as plaintiff as a result of orders by this Court, dated March 28, 1955, and April 12, 1955. *Pierce* v. *Allen B. DuMont Laboratories, Inc.*, 297 F. 2d 323 (3rd Cir. 1961); *Armstrong* v. *Allen B. DuMont Laboratories*, 137 F. Supp. 659 (D. Del. 1955); *Armstrong* v. *Emerson Radio and Phonograph Corp.*, 132 F. Supp. 176 (S. D. N. Y. 1955), followed by that Court in its later decision reported at 179 F. Supp. 95.

3. The '069 patent is valid and Motorola has infringed claims 1 and 2 thereof by the manufacture and sale of FM

broadcast receivers, television sound receivers and FM communication apparatus. For liberality of construction and broad protection to be accorded to patents on inventions of great merit and broad scope, see *Rubber Company* v. *Goodyear*, 9 Wall. 788, 76 U. S. 788, 19 L. Ed. 566 (1869); *Leeds & Catlin Co.* v. *Victor Talking Mach. Co.*, 213 U. S. 301, 29 S. Ct. 495, 53 L. Ed. 805 (1909); *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, 43 S. Ct. 322, 67 L. Ed. 523 (1923); *Wright Co.* v. *Herring-Curtiss Co.*, 177 F. 257 (C. C. 1910), aff'd final hearing, 204 F. 597, aff'd 211 F. 654 (2nd Cir. 1914) and companion case *Wright Co.* v. *Paulhan*, 177 F. 261 (C. C. S. D. N. Y. 1910); *American Stainless Steel Co.* v. *Ludlum Steel Co.*, 290 F. 103 (1923), and the decision on the accounting 16 F. 2d 823 (S. D. N. Y. 1926); *Permutit Co.* v. *Wadham*, 13 F. 2d 454 (6th Cir. 1926), rehearing denied 15 F. 2d 20; *Smith* v. *Snow*, 294 U. S. 1, 55 S. Ct. 279, 79 L. Ed. 721 (1935). For plaintiff's right to recover on theory of contributory infringement, see *Leeds & Catlin Co.* v. *Victor Talking Mach. Co., supra; Stewart-Warner Corporation* v. *Le Vally*, 15 F. Supp. 571 (N. D. Ill. 1936), affirmed *Lincoln Engineering Co. of Illinois* v. *Stewart-Warner Corporation*, 91 F. 2d 757 (7 Cir. 1937), reversed on other grounds 303 U. S. 545, 58 S. Ct. 662, 82 L. Ed. 1008; *Girdler Corporation* v. *E. I. DuPont De Nemours & Co.*, 56 F. Supp. 871 (D. Del. 1944), affirmed per curiam 152 F. 2d 757 (3rd Cir. 1946); *Detroit Lubricator Co.* v. *Toussaint*, 57 F. Supp. 837 (N. D. Ill. E. D. 1944), *Metallizing Engineering Co.* v. *Metallizing Co. of America*, 62 F. Supp. 274, 276-277 (S. D. N. Y. 1945); *Florence-Mayo Nuway Co.* v. *Hardy*, 168 F. 2d 778 (4th Cir. 1948); *Harris* v. *National Machine Works*, 171 F. 2d 85 (10th Cir. 1948); 35 U. S. C. § 271(d) (3) 1952. See Memorandum Opinion of this Court dated June 14, 1961.

4. The '066 patent is valid and Motorola has infringed

claims 8, 9 and 10 thereof by the manufacture and sale of FM broadcast receivers, television sound receivers and receivers for FM communication apparatus.

5. The Reissue patent is valid and Motorola has infringed claims 1, 2, 4 and 6 thereof by the manufacture and sale of FM broadcast receivers and television sound receivers.

6. Motorola had no license under the patents in suit by virtue of any license that it may have had under the '447 patent.

[7-9] 7. Plaintiff's right to recover damages is not barred by laches. *Amalgamated Dental Co.* v. *Lang Dental Mfg. Co.*, 200 F. Supp. 814 (N. D. Ill. E. D. 1961); *Howe* v. *General Motors Corporation*, 167 F. Supp. 330 (N. D. Ill. E. D. 1958); *Pierce* v. *International Telephone & Telegraph Corp.*, 147 F. Supp. 934 (D. N. J. 1957). Armstrong was justified in not filing suit during World War II. *Alliance Securities Co.* v. *De Vilbiss Mfg. Co.*, 41 F. 2d 668 (6th Cir. 1930); *Mills Novelty Co.* v. *Monarch Tool & Mfg. Co.*, 49 F. 2d 28 (6th Cir. 1931), certiorari denied 284 U. S. 662, 52 S. Ct. 37, 76 L. Ed. 561; *Harris* v. *Air King Products Co.*, 87 F. Supp. 572, affirmed 183 F. 2d 158 (2nd Cir. 1950). Armstrong was justified in not filing suit against Motorola while prosecuting an infringement suit against RCA. *Montgomery Ward & Co.* v. *Clair*, 123 F. 2d 878 (8th Cir. 1941); *Clair* v. *Kastar, Inc.*, 148 F. 2d 644 (2nd Cir. 1945); *Stearns-Roger Mfg. Co.* v. *Brown*, 114 F. 939 (8th Cir. 1902); *Timolat* v. *Franklin Boiler Works Co.*, 122 F. 69 (2nd Cir. 1903); *United States Mitis Co.* v. *Detroit Steel & Spring Co.*, 122 F. 863 (6th Cir. 1903); *Clements Mfg. Co.* v. *Eureka Vacuum Cleaner Co.*, 70 F. 2d 701 (2nd Cir. 1934); *Texas Co.* v. *Globe Oil & Refining Co.*, 112 F. Supp. 455 (N. D. Ill. E. D. 1953).

8. Plaintiff is entitled to an accounting of the actual

damages sustained by plaintiff and plaintiff's predecessor, Armstrong, as a result of the infringing manufacture and sale by Motorola of FM apparatus. All matters relating to patent marking and other notice of infringement and to the award of costs, attorneys' fees and interest are reserved for hearing at such accounting and for determination by this Court after such accounting shall be had.

Memorandum Accompanying Findings of Fact and Conclusions of Law.

In view of the extraordinary comprehensive Report, Court's Exhibit 1, for identification, submitted before trial by the Expert, Dean George R. Town, appointed upon agreement of counsel, and the very detailed findings covering the mass of evidence, which findings of fact and conclusions of law are filed herewith, a separate opinion on the merits would be superfluous and repetitious. Furthermore, many of the points here made were covered in the extended opinion of Judge Edmund L. Palmieri in *Armstrong* v. *Emerson Radio and Phonograph Corporation*, 179 F. Supp. 95 (S. D. N. Y. 1959), involving the same patents and claims as are here in suit. This Court is also in accord with Judge Palmieri's decision that there was no misuse of the '069 patent or the other patents in suit and that the Reissue was lawfully reissued. The Court wishes, however, to record its appreciation for the expert assistance rendered by Dean Town to the Court.

APPENDIX C.

STATUTORY PROVISIONS.

1. Sections 112, 251 and 271(a) of the Patent Code of 1952 [35 U. S. C. §§ 112, 251, 271(a)] provide:

§ 112. *Specification.*

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

§ 251. *Reissue of defective patents.*

Whenever any patent is, through error without any deceptive intention, deemed wholly or partly inoperative or invalid, by reason of a defective specification or drawing, or by reason of the patentee claiming more or less than he had a right to claim in the patent, the Commissioner shall,

on the surrender of such patent and the payment of the fee required by law, reissue the patent for the invention disclosed in the original patent, and in accordance with a new and amended application, for the unexpired part of the term of the original patent. No new matter shall be introduced into the application for reissue.

The Commissioner may issue several reissued patents for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for a reissue for each of such reissued patents.

The provisions of this title relating to applications for patent shall be applicable to applications for reissue of a patent, except that application for reissue may be made and sworn to by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.

No reissued patent shall be granted enlarging the scope of the claims of the original patent unless applied for within two years from the grant of the original patent.

§ 271. *Infringement of patent.*

(a) Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent.

2. Sections 33, and 64 of the predecessor statutes to Sections 112, and 251 respectively (35 U. S. C. § 33; R. S. 4888; and § 64; R. S. 4916) provide:

§ 33; R. S. 4888. *Application for patent; description; specification and claim.*

Before any inventor or discoverer shall receive a patent for his invention or discovery he shall make application therefor, in writing, to the Commissioner of Patents, and

shall file in the Patent Office a written description of the same, and of the manner and process of making, constructing, compounding, and using it in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct, compound, and use the same; and in case of a machine, he shall explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions; and he shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery. The specification and claim shall be signed by the inventor. No plant patent shall be declared invalid on the ground of noncompliance with this section if the description is made as complete as is reasonably possible.

§ 64; R. S. 4916. *Reissue of defective patents.*

Whenever any patent is wholly or partly inoperative or invalid, by reason of a defective or insufficient specification, or by reason of the patentee claiming as his own invention or discovery more than he had a right to claim as new, if the error has arisen by inadvertence, accident, or mistake, and without any fraudulent or deceptive intention, the commissioner shall, on the surrender of such patent and the payment of the duty required by law, cause a patent for the same invention, and in accordance with the corrected specification, to be reissued to the patentee or to his assigns or legal representatives, for the unexpired part of the term of the original patent. Such surrender shall take effect upon the issue of the reissued patent, but in so far as the claims of the original and reissued patents are identical, such surrender shall not affect any action then pending nor abate any cause of action then existing, and the reissued patent to the extent that its claims are identical with the

original patent shall constitute a continuation hereof and have effect continuously from the date of the original patent. The commissioner may, in his discretion, cause several patents to be issued for distinct and separate parts of the thing patented, upon demand of the applicant, and upon payment of the required fee for a reissue for each of such reissued letters patent. The specifications and claims in every such case shall be subject to revision and restriction in the same manner as original applications are. Every patent so reissued, together with the corrected specifications, shall have the same effect and operation in law, on the trial of all actions for causes thereafter arising, as if the same had been originally filed in such corrected form; but no new matter shall be introduced into the specification, nor in case of a machine patent shall the model or drawings be amended, except each by the other; but when there is neither model nor drawing, amendments may be made upon proof satisfactory to the commissioner that such new matter or amendment was a part of the original invention, and was omitted from the specification by inadvertence, accident, or mistake, as aforesaid.

APPENDIX D.

CLAIMS 1 AND 2 OF PATENT NO. 1,941,069.

1. The [method of eliminating in radio signaling disturbances having the nature of a spectrum,]

(a) which consists in producing a variation in frequency of the wave to be transmitted substantially greater in extent than the frequency range of good audibility, transmitting such wave,

(b) receiving the wave and amplifying the received currents, substantially eliminating amplitude variations so as to minimize the noise caused by the amplitude variations due to the disturbances, translating the frequency variations of the received signal into amplitude variations by a selective system which is fully responsive to the wide variations of the signal, but substantially not responsive to the lesser variations in frequency of the spectrum of the disturbances to be eliminated.

2. A [system for eliminating in radio signaling disturbances having the nature of a spectrum,]

(a) comprising means at the transmitter for producing a variation in frequency of the wave to be transmitted, substantially greater in extent than the frequency range of good audibility,

(b) means at the receiver for amplifying the received currents, current limiting means for substantially eliminating amplitude variations, and a detector system for translating the frequency variations of the received signal into amplitude variations, said system being fully responsive to the wide variations of the signal but substantially not responsive to the lesser variations in frequency of the spectrum of the disturbances to be eliminated nor to variations in amplitude of said disturbances.

CLAIMS 1, 2, 4 AND 6 OF REISSUE PATENT NO. 21,660.

1. The [method of transmitting and reproducing] a band of signaling frequencies

6. The [method of reproducing] the signaling frequencies of a wide swing frequency

(a) which consists in amplifying the high frequencies of the band to a substantially greater degree than the low frequencies thereof, varying the frequency of the wave to be transmitted by the amplified currents to produce a wide band of frequency variations, transmitting such wave,

(b) receiving the wave and amplifying the received currents, passing the amplified currents through a detecting device having an admittance band substantially wider than said wide band of frequency variations and translating in the detecting device the frequency variations into a band of currents of variable amplitude whereby distortions which arise in the translation in the detecting device of the frequency variations into currents of variable amplitude are minimized, and amplifying the low frequency currents of said band to a substantially greater degree than the high frequency currents thereof.

2. In a [system for transmitting and reproducing] a band of signaling currents, in combination,

(a) means arranged to amplify the high frequency currents of the band to a substantially greater degree than the low frequency currents thereof, means for generating a carrier modulated wave predistorted in such manner that the ratio of the deviations of the wave to the amplitudes of the corresponding signaling currents is greater for the higher frequencies of the signaling currents than for the lower frequencies thereof,

[which method] consists in receiving the wave and amplifying the received currents, passing the amplified currents through a detecting device having an admittance band substantially wider than the width of the wide swing of the said wave and translating in the detecting device the frequency variations into signaling currents of variable amplitude, whereby distortions which arise in the translation in the detecting device of the frequency variations into currents of variable amplitude are minimized, and amplifying the signaling currents of the lower frequencies to a substantially greater degree than the signaling currents of the higher frequencies.

4. A [receiver] adapted to receive a wide swing frequency modulated wave predistorted in such manner that the ratio of the deviations of the wave to the amplitudes of the corresponding signaling currents is greater for the higher frequencies of the signaling currents than for the lower frequencies thereof,

wave of substantially constant frequency, means for causing the amplified currents to vary over a wide range the frequency of the carrier wave, means for transmitting such wave,

(b) means for receiving the wave and amplifying the received currents, means coupled to said last-named means for converting the frequency variations into a band of currents of variable amplitude and having an admittance band width substantially greater than the width of the said wide range of carrier frequencies, a detecting device coupled to said converting means for deriving the band of modulation currents, and amplifying means coupled to the detecting device arranged to amplify the low frequency currents of the band to a substantially greater degree than the high frequency currents thereof to reproduce the signaling currents whereby distortions which arise in the translation in the converting means of the frequency variations into currents of variable amplitude are minimized.

said [receiver] comprising means for receiving the wave and amplifying the received currents, converting means coupled to said last-named means for causing the frequency variations to create currents of variable amplitude and having an admittance band width substantially greater than the width of the wide swing of said wave, a detecting device coupled to said converting means for deriving the signaling currents therefrom, and amplifying means coupled to the detecting device arranged to amplify the signaling currents of the lower frequencies to a substantially greater degree than the signaling currents of the higher frequencies.